Chapter 8
Data Management, 2001-2002

Introduction

All data collected by the Environmental Monitoring Program (EMP) are stored in digital format for data management and dissemination. Each monitoring element (discrete and continuous water quality, benthic, phytoplankton, and zooplankton) has a particular method of data entry, quality control, management, and dissemination. All data, except zooplankton and sediment composition, can be downloaded via the World Wide Web, either from the Bay Delta and Tributaries database (BDAT) or from the Interagency Ecological Program's Data Storage System (IEP-DSS).

BDAT consolidates and provides public access to environmental data contributed by more than fifty organizations. The database includes water quality, biological, and meteorological data from throughout the Sacramento-San Joaquin Estuary's watershed. The EMP's discrete water quality, benthic and phytoplankton data stored in this database are available over the Internet at: http://baydelta.water.ca.gov.

IEP is a joint effort by state and federal agencies to gather and provide information on the factors that affect ecological resources in the Sacramento-San Joaquin Estuary. IEP compiles extensive hydrodynamic and water quality data collected by different agencies at more than 120 sampling stations in the Delta and its tributaries. These data are stored in a Data Storage System (DSS) developed by the US Army Corps of Engineer's Hydrologic Engineering Center. In the future these time-series data will be integrated into the BDAT database. The EMP's continuous water quality data are now available through the IEP-DSS at: http://www.iep.water.ca.gov/dss/

Information about the various EMP monitoring elements and detailed information about the EMP can be found at: http://www.iep.water.ca.gov/emp/.

Metadata information—describing, in detail, sampling site locations, sampling methodology, and field and laboratory processing for all the data variables—is available on the IEP website at: http://www.iep.water.ca.gov/emp/Metadata/metadata_index.html

Complete metadata files are available for the benthic and phytoplankton monitoring elements of this program. Metadata files are being developed for continuous water quality and the zooplankton monitoring elements. These files also provide contact information for staff responsible of each monitoring element.

Data Management Procedures

The procedures for handling each type of EMP data are described below. The description includes where the data are stored, how the data are checked for quality, what data are available, how to obtain these data, and who is responsible for managing the data for each monitoring element. Water quality is monitored with both discrete and continuous sampling. The discrete monitoring sites are surveyed monthly, primarily by vessel. The continuous monitoring stations are equipped with automated probes and data recorders that log data every 10 minutes to 1 hour depending on the water quality variable.

Discrete Water Quality Data

During monthly sampling runs, field measurements are recorded on paper datasheets and entered into the field module of DWR's Field and Laboratory Information Management System (FLIMS) using a portable computer. Later, laboratory analyses are performed at DWR's Bryte Laboratory, and the results are entered by laboratory staff into the lab module of the FLIMS database. Data are then loaded electronically into the EMP's Discrete Water Quality database, which is implemented using Microsoft Access. This Access database is the reference database for this program element. EMP staff periodically review the data for accuracy, completeness, and consistency against paper datasheets records. Data are then exported electronically to BDAT each month.

Discrete water quality data from 1975 to present are available for download through the BDAT web interface at http://baydelta.water.ca.gov/index.html.

For more information regarding management of and access to discrete water quality data, contact Scott Waller at swaller@water.ca.gov.

Continuous Water Quality Data

Data from automated continuous water quality monitoring stations are downloaded from each station's data recorders onto a handheld "pocket PC". Upon return to the office, data are loaded in a Microsoft Excel spreadsheet. EMP staff review these data for accuracy, completeness, and consistency using probe verification and calibration records. Data that are determined to be the result of a measuring instrument that was operating out of proper calibration are flagged as "bad", and are retained in the spreadsheet file. The collection of Excel spreadsheets constitutes the reference database for this program element. Selected data (temperature, dissolved oxygen, electroconductivity, pH, and river stage) are uploaded electronically into the IEP-DSS. However, data flagged as "bad" are not transferred.

Continuous water quality data from 1983 to present are available for download at the IEP DSS database at: http://iep.water.ca.gov/dss/

EMP staff members are currently developing a comprehensive continuous water quality database that will become the reference database and will be available for export data to BDAT.

For more information regarding management of and access to continuous water quality data, please contact Mike Dempsey at: mdempsey@water.ca.gov.

Benthic Data

Benthic sampling sites are surveyed monthly by vessel. Laboratory identification and enumeration of macrobenthic organisms in each sample is performed by Hydrozoology, a private laboratory under contract with DWR. The results are reported to DWR on standard paper datasheets. Laboratory analysis of sediment samples is performed by DWR's Soils and Concrete Laboratory. The results of the sediment analyses are provided to EMP staff in a written report.

Both sediment and benthic organism data are entered into the EMP Benthic database, which was implemented using Microsoft Access database software. This Access database is the reference database for this program element. EMP staff periodically reviews the data for accuracy, completeness and consistency. Data are exported electronically to BDAT each month.

Benthic data from 1975 to present are available for download through BDAT's Web interface at: http://baydelta.water.ca.gov/index.html.

Sediment composition data gathered by the benthic monitoring element have been exported to BDAT, but are not yet available for download via the Internet.

For more information regarding benthic or sediment data, please contact Karen Gehrts at: kagehrts@water.ca.gov.

Phytoplankton Data

Phytoplankton sampling sites are surveyed monthly, primarily by vessel. DWR's Bryte Laboratory identifies, enumerates, and measures the size of the phytoplankton from these samples. These data are entered into the EMP Phytoplankton database using Microsoft Access software. This Access database is the reference database for the phytoplankton monitoring element. EMP staff periodically reviews the data for accuracy, completeness, and consistency. Data are exported electronically to BDAT each month.

Phytoplankton data from 1975 to present are available for download through the BDAT web interface at: http://baydelta.water.ca.gov/index.html.

For more information regarding phytoplankton data, please contact Shaun Philippart at: sphilipp@water.ca.gov.

Zooplankton Data

Zooplankton sampling sites are surveyed monthly by vessel. Laboratory identification and enumeration of zooplankton and mysid organisms is performed by the Department of Fish and Game's Central Valley Bay-Delta Branch Laboratory. The results are entered into a computer at the DFG office and stored electronically in a SAS statistical package format. Data are

periodically reviewed for accuracy and completeness by DFG staff. Currently zooplankton data are only available through DFG; however, construction is under way for a zooplankton database that is able to export data to BDAT.

Data are available upon request from Lee Mecum at: lmecum@delta.dfg.ca.gov.